

(19) World Intellectual Property  
Organization  
International Bureau



549 522

(43) International Publication Date  
30 September 2004 (30.09.2004)

PCT

(10) International Publication Number  
**WO 2004/082377 A1**

(51) International Patent Classification<sup>7</sup>: **A01M 7/00**,  
17/00, 21/00, 21/04, A22B 5/10, A47L 15/42, B05B 9/00,  
15/00, D06F 39/04, F24H 1/06, 1/10, 1/52, F16K 21/00,  
31/64, 31/68

(21) International Application Number:  
PCT/NZ2004/000055

(22) International Filing Date: 18 March 2004 (18.03.2004)

(25) Filing Language: English

(26) Publication Language: English

(30) Priority Data:  
524783 18 March 2003 (18.03.2003) NZ

(71) Applicant (for all designated States except US): **GREEN  
WEEDER HOLDINGS LTD** [NZ/NZ]; 18 Byron Av-  
enue, Takapuna, Auckland 1331 (NZ).

(72) Inventors; and

(75) Inventors/Applicants (for US only): **HIGHAM**, An-  
thony, J [NZ/NZ]; 42 Grand Drive, Remuera, Auckland  
1005 (NZ). **CLARK**, Peter, Bruce [NZ/NZ]; 32 Brick  
Bay Drive, Sandspit, RD2, Warkworth 1241 (NZ). **TAIT**,  
Brendon [NZ/NZ]; 73 Kingseat Rd, Patumahoe, Auckland  
1850 (NZ).

(74) Agents: **PIPER**, James et al.; 5A Pacific Rise, Auckland  
1006 (NZ).

(81) Designated States (unless otherwise indicated, for every  
kind of national protection available): AE, AG, AL, AM,  
AT, AU, AZ, BA, BB, BG, BR, BW, BY, BZ, CA, CH, CN,  
CO, CR, CU, CZ, DE, DK, DM, DZ, EC, EE, EG, ES, FI,

GB, GD, GE, GH, GM, HR, HU, ID, IL, IN, IS, JP, KE,  
KG, KP, KR, KZ, LC, LK, LR, LS, LT, LU, LV, MA, MD,  
MG, MK, MN, MW, MX, MZ, NA, NI, NO, NZ, OM, PG,  
PH, PL, PT, RO, RU, SC, SD, SE, SG, SK, SL, SY, TJ, TM,  
TN, TR, TT, TZ, UA, UG, US, UZ, VC, VN, YU, ZA, ZM,  
ZW.

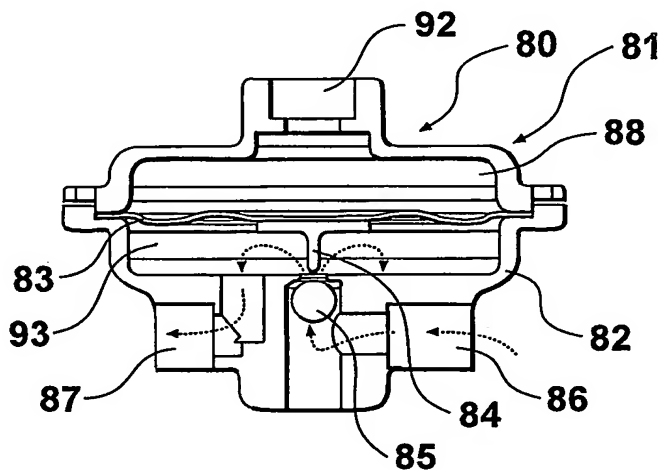
(84) Designated States (unless otherwise indicated, for every  
kind of regional protection available): ARIPO (BW, GH,  
GM, KE, LS, MW, MZ, SD, SL, SZ, TZ, UG, ZM, ZW),  
Eurasian (AM, AZ, BY, KG, KZ, MD, RU, TJ, TM), Euro-  
pean (AT, BE, BG, CH, CY, CZ, DE, DK, EE, ES, FI, FR,  
GB, GR, HU, IE, IT, LU, MC, NL, PL, PT, RO, SE, SI, SK,  
TR), OAPI (BF, BJ, CF, CG, CI, CM, GA, GN, GQ, GW,  
ML, MR, NE, SN, TD, TG).

**Declarations under Rule 4.17:**

— as to applicant's entitlement to apply for and be granted  
a patent (Rule 4.17(ii)) for the following designations AE,  
AG, AL, AM, AT, AU, AZ, BA, BB, BG, BR, BW, BY, BZ,  
CA, CH, CN, CO, CR, CU, CZ, DE, DK, DM, DZ, EC, EE,  
EG, ES, FI, GB, GD, GE, GH, GM, HR, HU, ID, IL, IN, IS,  
JP, KE, KG, KP, KR, KZ, LC, LK, LR, LS, LT, LU, LV, MA,  
MD, MG, MK, MN, MW, MX, MZ, NA, NI, NO, NZ, OM,  
PG, PH, PL, PT, RO, RU, SC, SD, SE, SG, SK, SL, SY, TJ,  
TM, TN, TR, TT, TZ, UA, UG, UZ, VC, VN, YU, ZA, ZM,  
ZW, ARIPO patent (BW, GH, GM, KE, LS, MW, MZ, SD,  
SL, SZ, TZ, UG, ZM, ZW), Eurasian patent (AM, AZ, BY,  
KG, KZ, MD, RU, TJ, TM), European patent (AT, BE, BG,  
CH, CY, CZ, DE, DK, EE, ES, FI, FR, GB, GR, HU, IE, IT,  
LU, MC, NL, PL, PT, RO, SE, SI, SK, TR), OAPI patent (BF,  
BJ, CF, CG, CI, CM, GA, GN, GQ, GW, ML, MR, NE, SN,  
TD, TG)

[Continued on next page]

(54) Title: FLUID HEATER



(57) Abstract: A portable fluid heating tool capable of  
heating a flow of water under mains pressure to about  
107 degrees Celsius and has a connection to a water sup-  
ply via a hose. Water flows through an electrical heater  
within the tool, then to a thermally controlled pressure  
regulating valve (80) and then to the outlet nozzle. This  
valve (80) has a moveable member such as a diaphragm  
(83) sealing off a pressure chamber (88). Movement of  
the diaphragm (83) causes a valve (85) to open or at least  
partly close. When closed the valve (85) impedes, or  
restricts the flow of water from an inlet (86) to an out-  
let (87) through the valve. On the other side of the di-  
aphragm a small quantity of water is trapped within the  
pressure chamber (88), so that as the valve (80) heats  
up, pressure within the pressure chamber (88) rises as  
the water turns to water vapour and the air within the  
chamber also expands. This increase in pressure within  
the pressure chamber (88) causes the diaphragm (83) to  
move slightly outwardly causing a pin (84) to allow

the ball valve (85) to open and allow maximum flow of the heated water through the valve (80) to the nozzle of the tool.

WO 2004/082377 A1



- as to applicant's entitlement to apply for and be granted a patent (Rule 4.17(ii)) for the following designations AE, AG, AL, AM, AT, AU, AZ, BA, BB, BG, BR, BW, BY, BZ, CA, CH, CN, CO, CR, CU, CZ, DE, DK, DM, DZ, EC, EE, EG, ES, FI, GB, GD, GE, GH, GM, HR, HU, ID, IL, IN, IS, JP, KE, KG, KP, KR, KZ, LC, LK, LR, LS, LT, LU, LV, MA, MD, MG, MK, MN, MW, MX, MZ, NA, NI, NO, NZ, OM, PG, PH, PL, PT, RO, RU, SC, SD, SE, SG, SK, SL, SY, TJ, TM, TN, TR, TT, TZ, UA, UG, UZ, VC, VN, YU, ZA, ZM, ZW, ARIPO patent (BW, GH, GM, KE, LS, MW, MZ, SD, SL, SZ, TZ, UG, ZM, ZW), Eurasian patent (AM, AZ, BY, KG, KZ, MD, RU, TJ, TM), European patent (AT, BE, BG, CH, CY, CZ, DE, DK, EE, ES, FI, FR, GB, GR, HU, IE, IT,

LU, MC, NL, PL, PT, RO, SE, SI, SK, TR), OAPI patent (BF, BJ, CF, CG, CI, CM, GA, GN, GQ, GW, ML, MR, NE, SN, TD, TG)

**Published:**

- with international search report  
— before the expiration of the time limit for amending the claims and to be republished in the event of receipt of amendments

For two-letter codes and other abbreviations, refer to the "Guidance Notes on Codes and Abbreviations" appearing at the beginning of each regular issue of the PCT Gazette.